DOCUMENT RESUME

ED 268 786 FL 015 602

AUTHOR Alme, Ann-Marie
TITLE Speech Planning in the Light of Stuttering.
PUB DATE 85
NOTE 11p.; In: Neurolinguistic Papers: Proceedings of the Finnish Conference of Neurolinguistics (2nd, Joensuu, Finland, May 31-June 1, 1985); see FL 015 600.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; Dialogs (Language); Error Patterns; Form Classes (Languages); Intonation; Language Research; Mild Disabilities; *Neurolinguistics; Phonology; Phrase Structure; *Reading Aloud to Others; Severe Disabilities; *Speech Handicaps; *Story Telling; *Stuttering

ABSTRACT

A study of overt audible speech behavior in eight male and one female Swedish adults examined the relationship between disfluency and speaking modality, disfluency type in mild versus severe stutterers, and disfluency and psycholinguistic variables. Three conditions of experimental manipulation were used: reading aloud, reading the longer lines of a brief dialogue, and silent reading and oral retelling of a story. The number of disfluencies and stutterings of nine specific types found in taped segments of each condition were tallied. As a group, the subjects showed an increase in disfluency across the three conditions, but individual patterns varied, with the more severely disfluent having unanticipated reduced stuttering in the third, most spontaneous condition. The psycholinguistic variables of grammatical class, word length, phonological position within a word, word position in the phrase, and syllable stress were also examined in the samples, and clear patterns of disfluency appeared in all but the word position variable. It is concluded that varying both speech material and speech tasks was an effective method for elucidation of various speech characteristics in audible speech behavior, highlighting both quantity and quality of speech disruptions and demonstrating differences between mild and severe stutterers. (MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

SPEECH PLANNING IN THE LIGHT OF STUTTERING

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Ann-Marie Almé

University of Stockholm

ED268786

FL 015 602

1. INTRODUCTION

The phenomenon of stuttering has confounded clinicians and scientists for literally hundreds of years. It still remains a clinical problem and a scientific challenge to those who are interested in deviant speech processes.

Speech is an important psychological activity, where we in interaction with other people are able to express feelings, thoughts and attitudes etc. and to give specific information. A communicative handicap such as stuttering does not only influence the speech itself, but also speech planning and the stutterer's interaction with other individuals. A person who stutters breaks the normal rules for interaction processes and there is an imbalance in the communication.

It is a well known fact that stuttering is highly dependent on contextual factors. Not only is stuttering behavior different from person to person, it even differs within the same person from moment to moment. Linguistic factors seem to be involved in stuttering, as well as in normal disfluency (Kansin & Bjerkan, 1982; Van Riper, 1982). One linguistic characteristic, the rhythm of speech, has been the focus of several studies. Wingate (1976, p. 260) viewed stuttering as a "prosodic defect", a defect in the transition to stressed syllables. He also pointed out the lack of research in other languages than English (Wingate, 1979).

The purpose of the present study was to investigate overt audible speech behavior in a group of nine stutterers under different conditions of experimental manipulation. The questions raised considered the relationship between:

- disfluency and speaking modality
- type of disfluency in mild vs. severe stutterers
- disfluency and psycholinguistic variables

In order to approach the above issues it is important to provide an operational definition of stuttering in speech. The various types of disfluency are classified into

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Tommola

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

nine categories. The classification system is partly based on material presented by Johnson (1961) and Wingate (1964).

PWR - Part-Word Repetitions: one or more repetitions of an element equal to or less than a syllable (including monosyllabic words).
AP - Audible Prolongation: audible prolongation of a phonetic segment.
SP - Silent Prolongation: tensely articulated stop closures (blocks). (In the larynx or somewhere else in the vocal tract.)
WWR - Whole-Word Repetitions: one or more repetitions of a word (not including monosyllabic words).
PR - Phrase Repetition: repeated utterance of two or more words.
I - Interjection: insertion of an extra sound before or within a word.
R - Revision: modification of phrase content.
BW - Broken Word: a word not completely pronounced.
HP - Hesitation Pause: an unusual un-filled pause which could not be classified as a silent prolongation.

The first three categories (PWR, AP, SP) were chosen as the definition of stutterings. "Stuttering interruptions to the forward flow of speech are primarily intra-morphemic; normal disfluencies are primarily supra-morphemic" (Van Riper, 1982). "...two "kernel" characteristics of stuttering speech can be discriminated: (a) repetitions (audible or silent) of single unit speech elements; and (b) prolongations (audible or silent) "(Wingate 1964, p. 487). Accordingly, the six remaining categories were considered as normal disfluencies.

These definitions can be applied to five psycholinguistic variables:

(1) grammatical class
(2) word length
(3) position within a word
(4) word position in a phrase
(5) syllable stress

2. METHOD

2.1. Subjects

One female and eight male Swedish speaking stutterers ranging in age from 23 to 46 served as subjects. The severity of stuttering varied from mild to severe. None of the subjects was currently involved in any kind of speech therapy.

2.2. Speech Material

In order to vary the speaking modality and cognitive load, the subjects were recorded in three different situations.

Condition I: oral reading task, where the reading material was a 160 word passage from a neutral text about gardening.
Condition II: reading a dialogue of 200 words. The experimenter was in the same room and read part of the dialogue, but the subjects had the longer lines. The text in this dialogue reflected a communicative situation of every day life.
Condition III: this condition should reflect spontaneous speech to a greater extent than the previous one. Subjects had to read a short story silently and then retell it in their own words (about 100 words).

By varying the complexity of the speech material and by progressively introducing more communicative demands and emotional stress an increase in disfluency should result. The phenomenon of adaptation, that is, the tendency to become more fluent in successive readings of the same or similar passages, should thus be avoided.

2.3. Procedure

Subjects were tested individually in a sound proof booth, and they spoke into a freestanding microphone (Sennheiser Mo 211 U). Recordings were made on a Teac R-340 tape recorder outside the booth. The experimenter had visual contact with the subjects.

Previous studies of stuttering (e.g. Young, 1961) have demonstrated that short segments of speech are sufficient to determine severity of stuttering and that

BEST COPY AVAILABLE

randomly selected samples could be used. Subsequently, from the total material, five phrases containing 4 - 9 words were randomly selected from each condition for analysis. The phrases from condition I and II were the same for each subject, but in the third condition they differed to some extent due to the spontaneous nature of that condition. In order to have an exact delimitation of a phrase and the same sound level for all phrases, a special computer program was used (written by R. Carlsson at KTH, Stockholm). The final test tape consisted of 135 phrases.

The number of disfluencies and stutterings was counted from the audio tape. The syllable was chosen as the reference unit, in preference to the word, since it is relatively invariant in length, thereby giving a more stable basis for comparison. Frequency counts of disfluency and stuttering are expressed in percentages in relation to the total number of syllables (% SyD and % SyS). Each disfluency event was only counted and listed once in the above mentioned classification system. That means, that if a subject had both a prolongation and a repetition in a word, only the most prominent one was counted and put into a category.

3. RESULTS AND DISCUSSION

3.1. Speaking Modality and Disfluency

As a group, the subjects showed an increase in disfluency across conditions. The mean frequency of % SyD was 12 % in the oral reading task, 14 % in the dialogue condition, and 20 % in the spontaneous speech condition. For the same conditions, the mean frequency of % SyS was 11 %, 13 %, and 12 % respectively.

Looking at individual data, however, a somewhat different pattern was indicated. As Figures 1a and 1b clearly show, there was a noticeable difference in disfluency and stuttering between conditions and between subjects. The nine subjects could be said to form two subgroups depending on their disfluency scores. Five of the subjects fell within the range of moderate - severe, with a mean of 21.3 % SyD (MS-group). Four subjects with mild stuttering (7,5 % SyD) formed the M-group.

Of particular interest are the data from the MS-group. This group showed a significant increase in disfluency and stuttering from oral reading condition to dialogue condition ($p < .05$, two-tailed t-test). In condition III with spontaneous speech they remained highly disfluent but the decrease in stuttering is remarkable.

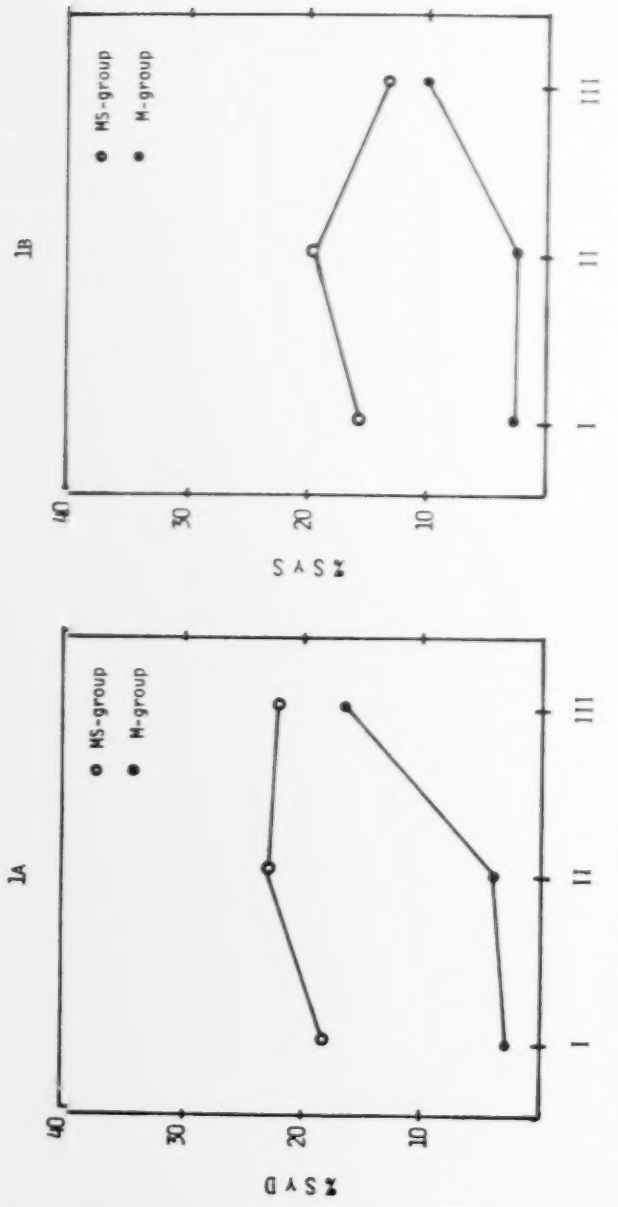

Figure 1A and 1B. Mean percentage of disfluency (% SyD) and stuttering (% SyS) for mild stutterers (M) and moderate-severe stutterers (MS) during three successive speaking tasks; I = oral reading, II = dialogue, and III = spontaneous speech.

The M-group, however, was rather fluent during the first two conditions, but had a significant increase in both disfluency and stuttering in the third condition ($p < .001$).

The between group difference was significant in condition I and in condition II ($p < .001$). The mean frequency of % SyD and % SyS was higher for moderate - severe stutterers even in the third condition compared to mild stutterers, but the difference was not significant.

The dissimilar group trends in fluency break-downs across speech conditions are interesting but difficult to interpret. The dialogue condition was obviously the most "difficult" one for subjects with moderate - severe stuttering. This communicative situation required quick initiation of responses and this fact might have had an increasing effect on expectancy of fear and speech anxiety. Furthermore, the experimenter was sitting in the same room in order to read the opposite lines in the dialogue. This created a more social speaking situation.

Another possible reason for increased fluency failures may be the prosodic factor. Stress and intonation patterns require co-ordination and exact timing and increased activity of the speech mechanism. In Swedish there are two tonal accents, accent I and accent II. In accent II words, the presence of a main stress implies a secondary stressed syllable within the same word. The dialogue task contained more bi- and polysyllabic accent II-words.

The reduced frequency of stuttering for the MS-group in the third condition was remarkable. During spontaneous speech it was possible to avoid certain sounds and "difficult" words by circumlocution and also by using synonyms and fewer polysyllabic words.

3.2. Type of Disfluency

Table I shows the types of disfluencies for all subjects across all conditions. For the total group 78 % of the disfluencies were classified as stutterings. Part-word repetition (PWR) was found to be the most common speech disruption. Subjects with severe stuttering exhibited substantially more repetitions of phonetic segments. They also exhibited instances of stuttering within a word, most of them occuring on stressed syllables. Silent and audible prolongations of sounds (SP and AP) were the second most common type of disfluency. These types were rarely observed in the speech of mild stutterers. 11 % of observed disfluencies were interjections (I). Although insertions of extra sounds or syllables are not uncommon in normal speech, such disruptions are probably sometimes part of the stuttering behavior as they

occur as "starters". Starters can be used before a difficult sound or word to facilitate the utterance, to get started. Gradually the starters will be stereotyped and of no aid anymore. One subject had insertion of "uh"-sounds before and within several words, but with the stringent operational definition of stuttering in this study they were classified as normal disfluencies.

Table I. Distribution of type of disfluency for mild (M) and moderate-severe (MS) stutterers.

	M-group	MS-group	total	%
PWR	27	52	79	33.9
AP	2	48	50	21.5
SP	5	47	52	22.3
WWR	3	1	4	1,7
PR	2	2	4	1.7
I	5	20	25	10.7
R	2	2	4	1.7
BW	2	2	4	1.7
HP	4	7	11	4.7
total	52	181	233	

3.3. Psycholinguistic Variables

3.3.1. Grammatical class. Most of the stutterings occurred on content words (68 %). This finding was most striking for the severe stutterers. Mild stutterers seemed to have a more even distribution of disfluencies between content words and function words. Some studies have indicated that content words are stuttered upon more frequently because they are more meaningful and important, because they have a higher information value and have a tendency to start with a consonant.

3.3.2. Word length. The three word lengths tested were monosyllabic, bisyllabic, and polysyllabic. The mean percentage of fluency failure was analyzed with respect to the occurrence of the words. Looking at the whole group, the results indicated that as syllabic length increases there is a corresponding increase in fluency failures. But, again, there is a difference in the pattern for the subgroups. The MS-

group exhibited a significantly higher rate of disfluency on polysyllabic words than did the M-group.

3.3.3. Position within a word. The following positions were observed: stutterings on the initial sound, the first syllable, and the medial syllable/s. The initial sound and the first syllable are without doubt the most conspicuous positions for fluency failures. The severe stutterers demonstrated far more stutterings on initial sounds, both repetitions and prolongations. They also had several fluency failures within a word, which was never demonstrated by the mild stutterers. The most common for this group was repetition of the first syllable, particularly repetition of monosyllabic words.

3.3.4. Word position in the phrase. The first word, or words early in the sentence, are said to be stuttered upon more frequently than are the remaining words (e.g. Brown, 1938). Clauses analyzed in the present study varied in length from 2 - 9 words (average 5.4 words). In this material, the first three words have only 50 % of the total stuttering occurrences. This is contrary to a majority of other investigations. However, there are some other studies which have shown that the medial part of a sentence had a higher rate of fluency failures and that they sometimes tended to occur in "vollies" on odd numbered words (e.g. Rieber et al, 1976; Soderberg, 1967). This suggests the need for further studies regarding the parameters of stress and intonation patterns in relation to word position.

3.3.5. Syllable stress. A significant difference can be noted between stressed and unstressed syllables. Stutterings occured on 20 % of the stressed syllables compared to only 8 % of the unstressed syllables. It is possible that this partly explains the word position results, since in the speech material for this experiment accented words and stressed syllables did not have an early position in the sentence in most cases. Thus, the fluency failures were most frequent in medial position which tended to be stressed. In Figure 2 the stuttering events are plotted in relation to the total number of stressed and unstressed syllables in all three conditions. An increase in stuttering frequency corresponded to an increase in the difference between syllables. The number of stutterings on stressed syllables was considerable for the MS-group.

BEST COPY AVAILABLE

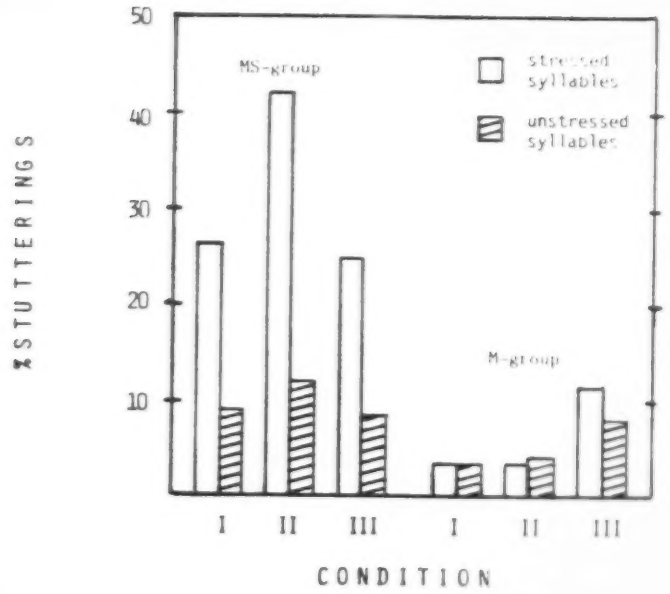

Figure 2. Mean percentage of stuttering in relation to the number of stressed vs. unstressed syllables in oral reading (I), dialogue (II), and spontaneous speech (III); MS-group = moderate-severe stutterers and M-group = mild stutterers.

This sentence is a good example of the observation that fluency failures are not randomly distributed. The crosses mark stuttering events from several subjects.

gäller inte samma regler på alla bussar då

x x x x x x

x x x x

The results of the current study thus indicate that varying both speech material and speech tasks was an effective method for elucidation of various speech characteristics in audible speech behavior; both quantity and quality in speech

disruptions were highlighted. In addition, the difference between mild and severe stutterers was demonstrated.

A task of great significance in speech and language research is to investigate characteristics in disordered speech and language. Studies which elucidate linguistic and acoustic characteristics of stuttering will not only be of great clinical importance, but also shed some light on speech planning processes and thus contribute to the research on speech as a window to the brain.

References

Brown, S.F. 1938. Stuttering with relation to word accent and word position. Journal of Abnormal and Social Psychology, 33: 112-120.

Johnson, W. 1961. Measurement of oral reading and speaking rate and disfluency of adult male and female stutterers and nonstutterers. Journal of Speech and Hearing Disorders, Mono., Suppl., 7, 1-20.

Kaasin, K. & Bjerkan, B. 1982. Critical words and locus of stuttering in speech. Journal of Fluency Disorders, 7, 433-446.

Rieber, R.W., Smith, N., and Harris, B. 1976. Neuropsychological aspects of stuttering and cluttering. In R.W. Rieber (ed.), The Neuropsychology of Language. Plenum Press: New York.

Soderberg, G.A. 1967. Linguistic factors in stuttering. Journal of Speech and Hearing Research, 10, 801-810.

Van Riper, C. 1982. The Nature of Stuttering. Englewood Cliffs, N.J.: Prentice-Hall (2nd ed.).

Wingate, M. 1964. A standard definition of stuttering. Journal of Speech and Hearing Disorders, 29, 484-489.

Wingate, M. 1976. Stuttering: Theory and Treatment. New York: Irvington Publishers.

Wingate, M. 1979. The loci of stuttering: Grammar or prosody? Journal of Communication Disorders, 12, 283-290.

Young, M. 1961. Predicting ratings of severity of stuttering. Journal of Speech and Hearing Disorders, Mono., Sup. 7: 31-54.

BEST COPY AVAILABLE